Saskatchewan
Agriculture
and Food

FINAL REPORT

BEEF DEVELOPMENT FUND

20020254

CATTLE FACS

Funded by
The Beef Development Fund

January, 2005

Prepared by: Farm Animal Council For Saskatchewan (FACS)

CATTLE FACS BROCHURES

Report

a) SUMMARY

Vision Statement:

FACS is the collective voice for animal agriculture specific to animal care.

FACS advances the interests of the animal agriculture industry.

FACS advances the quality of animal care.

FACS' PURPOSE

FACS represents the livestock industry in advancing responsible animal care and handling practices in agriculture.

FACS' Rallying Cry

Advancing responsible animal care in agriculture.

105-02911/

FINAL REPORT FOR:
THE SASKATCHEWAN BEEF DEVELOPMENT FUND

of the Province of Saskatchewan
as represented by the
Saskatchewan Department of Agriculture,
Food and Rural Revitalization.

20020254

Submitted by:

FARM ANIMAL COUNCIL OF SASKATCHEWAN INC

502-45th Street West, 2nd Floor
Saskatoon, SK

December 21, 2004

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a) SUMMARY

*The **Cattle FACS** series is an educational tool for producers. It is designed to assist both new and existing producers by providing knowledge of symptoms, cause and treatment of common ailments found in modern cattle production.*

The purpose of this project is to educate producers as to the importance and benefits of responsible treatment of livestock. It is vital that producers know that the standard of care given to their animals will reflect on the developmental progress and well being of the animal. Consequently, management, handling and care techniques used, will contribute to the quality and value of the final product.

This most recent grant is relevant to drought related issues and feedstuffs. The new Cattle FACS cover the following topics:

- *Body Condition Scoring*
- *Managing Water Supplies In a Drought*
- *Feeding in a Cold Snap*
- *Feed Testing and Ration Balancing*
- *Early Weaning of Calves*
- *Creep Feeding Calves*
- *Problem Feeds*
- *Annual Crops for Emergency Grazing*
- *Not Enough Feed for the Winter?*
- *Nitrate Poisoning*

b) TECHNICAL REPORT

BACKGROUND AND OBJECTIVES

The original CATTLE FACS brochures, which started back in the late 1990's, were largely authored by Dr. Eugene Janzen, who at the time, was on the FACS Board of Directors and at the University of Saskatchewan. However, recently Dr. Janzen has moved to Alberta so as a result another knowledgeable writer needed to be identified.

With participation from veterinarians, producers, SAFRR and marketers, FACS has developed a series of bovine brochures addressing issues that can affect animals destined for market. Brochures addressing Cancer Eye, Carcass Quality Shortfalls, Non-Ambulatory Cattle, Cattle Handling, Calving, Colostrum, Euthanasia and Calf Scours have been completed.

The Cattle FACS Series has been received very positively by the livestock industry. Although the target audience is Saskatchewan producers, FACS received requests for the brochure from across Canada and from other countries including the United States, Australia, Bulgaria, Finland and the United Kingdom. In addition, Weir Veterinary Clinic in Lloydminster has had reprints made and distributed through their clinical newsletter; and the CCA has made reprints and included them in the CCA Quality Starts Here resource; SIAST has requested copies to incorporate in their educational materials along with recent requests from 4-H Clubs, the U of S Stockman's Club and the SSPCA.

In the development of the brochures authored by Dr. Janzen, FACS involved producers, veterinarians, Saskatchewan Livestock Markets and Order Buyers Association and the Canadian Cattlemen's Association. Prior to print, we approached the following groups to review each brochure and to endorse it: CCA, Saskatchewan Cattle Feeders Association, Saskatchewan Dairy Association, Saskatchewan Livestock Association, Saskatchewan Auction Market and Order Buyers Association and the Saskatchewan Stock Growers Association. In completing the Euthanasia brochure, the Saskatchewan SPCA also endorsed it.

For this series of Cattle FACS brochures, FACS retained the services of Mr. Allen Hingston, BSA, MSc. PAg to research, write and facilitate the endorsement process of the brochures. However, due to the BSE crisis, we encountered a major set back regarding the endorsement process.

As we feel strongly regarding the value in having industry endorsement, the brochures were sent to the Western Beef Development Fund, the Saskatchewan Livestock Association, the Saskatchewan Veterinary Medical Association and the Canadian Veterinary Medical Association for review, comments and endorsement. FACS was very pleased to have all four organizations provide praise and support for this effort.

c) **PERSONNEL**

The two key participants in developing the Cattle FACS Series are:

Project Manager
Adele Buettner, Executive Director of FACS

Author
Mr. Allen Hingston, BSA, MSC. PAg

d) **EQUIPMENT**

Not applicable

e) **PROJECT DEVELOPED MATERIALS**

Attached are the various Cattle FACS Brochures.

f) **PROJECT PHOTOS**

Not applicable.

g) **ACKNOWLEDGEMENT**

Recognition of this project was acknowledged through:

- *FACStracs news letter*
- *FACS Brochure*
- *FACS website*
- *Verbal acknowledgment at the FACS AGM*
- *Recognition on each issue of the Cattle FACS Brochures*

Cattle FACS: Body Condition Scoring

Body Condition Scoring (BCS) is a valuable management tool for estimating the amount of energy reserves (body fat) an animal is carrying. Body condition can be used to adjust feeding programs throughout the year to optimize efficient use of available feed, to maintain herd fertility (i.e. the likelihood of cows cycling and breeding on time) and indirectly, to maintain calf weaning weights.

In a sense, BCS adds scientific calibration to the experienced eye of the cattleman. BCS, as a hands-on determination, even though it is somewhat subjective, is more accurate than visual appraisal alone. Even the experienced eye will have trouble picking more than the extremes of very thin or very fat in a herd with a mixture of body types. Through discerning and managing the in-between scores of the majority of the cow herd the good cattleperson can make a difference in controlling feed costs while maintaining productivity.

The **Scottish Body Condition Scoring System**, which is widely used in Canada, describes five scores (1 through 5) but allows for half scores e.g. BCS 2.5 would indicate an animal is between BCS 2 and BCS 3 in condition. It is easy to learn, anyone can do it.

BCS as a Management Tool

Ideally the herd should be body condition scored at weaning, at calving and 30 days before breeding. Each cow should be scored and records kept from year to year. In a large herd, scoring a percentage of cows might be sufficient.

For optimum efficiency of winter feeding and rebreeding following calving, mature cows should go into winter with a minimum BCS of 3.0 and not drop below BCS 2.5 at calving or during the breeding season. First and second calf heifers should not drop below 3.0 at calving and during the breeding season. Nutritional management strategies which focus on maintaining these BCS levels result in lower winter feed costs, faster post calving return to oestrus, higher percentage of calves born early in calving season and higher weaning weights.

One-half BCS represents about 100 lbs of body weight in a mature cow, which would weight 1100 lbs at BCS 2.5. Based on 150+ days winter-feeding to calving, an 1100 lb cow with BCS 2.5 at weaning needs about 22 to 24 lbs of hay per day to maintain body condition through to calving. If she weighed 1200 lbs with BCS 3.0, she can get by with 18 to 20 lbs of hay, lose 0.5 lbs per day and still calve with BCS 2.5. If she weighed 1000 lbs with BCS 2.0 she would need about 30 to 32 lbs of hay to reach BCS 2.5 at calving as she needs more feed to keep warm and to gain weight. If cows are not gaining condition late in the fall, consider creep feeding the calves and weaning early. Feed first (and second) calf heifers and thin cows separately from the main herd and remember that some of the herd may not maintain or gain condition even with adequate feed so be prepared to adjust groupings during winter.

Flushing only works if a cow can gain enough condition to reach BCS 2.5 by breeding time. If she calves with BCS 2.0 and you want to breed her in 60 to 90 days, she needs to gain 1.5 lbs daily plus feed her calf, so adjust the ration accordingly (about 10 extra pounds of barley). However, if she is a good milker, with the extra feed she may produce more milk than the calf can use, which creates problems in itself.

How to Estimate BCS

Body fat content is estimated by thumb pressure on the end of the short ribs over the loin area between the hip bone (hook) and the last rib. There is no muscle at the end of the short ribs so any padding on the ribs is fat cover.

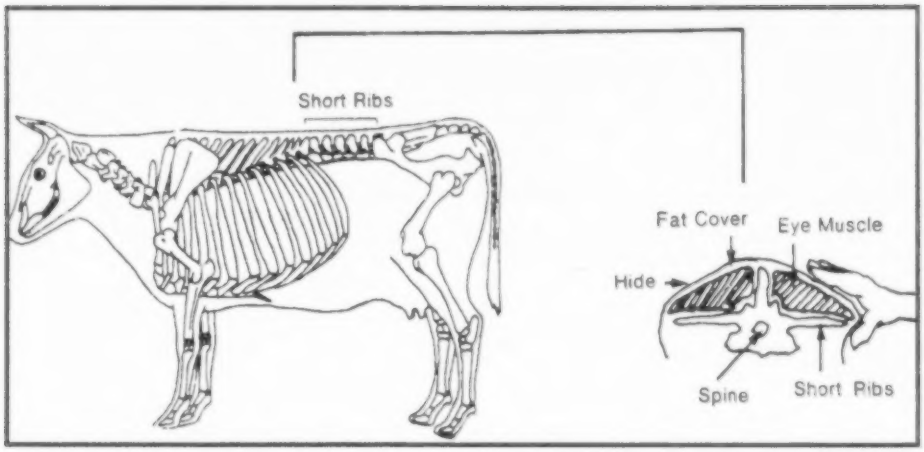

Figure 1: BCS is estimated by thumb pressure on the ends of the short ribs.

BCS 1 – severely emaciated

- Individual short ribs are sharp to the touch as are virtually all skeletal structures.
- There is no fat around the tailhead; hip bones, tailhead and ribs are visually prominent.

BCS 2 – moderately thin

- Individual short ribs can be identified but feel rounded not sharp.
- Some fat cover is visible around the tailhead and over the hip bones; individual ribs are no longer obvious.

BCS 3 – Optimum

- Ends of short ribs can only be felt with firm pressure.
- Fat on either side of the tailhead can easily be felt.

BCS 4 – Moderately fleshy

- Short ribs cannot be felt even with firm pressure.
- Soft rounds of fat are visible around the tailhead; folds of fat are beginning to develop over ribs and thighs.

BCS 5 – Very Fat

- Short ribs are completely covered in fat and bone structure is no longer evident.
- Tailhead and hip bones are buried in fat; folds of fat are evident over ribs and thighs.

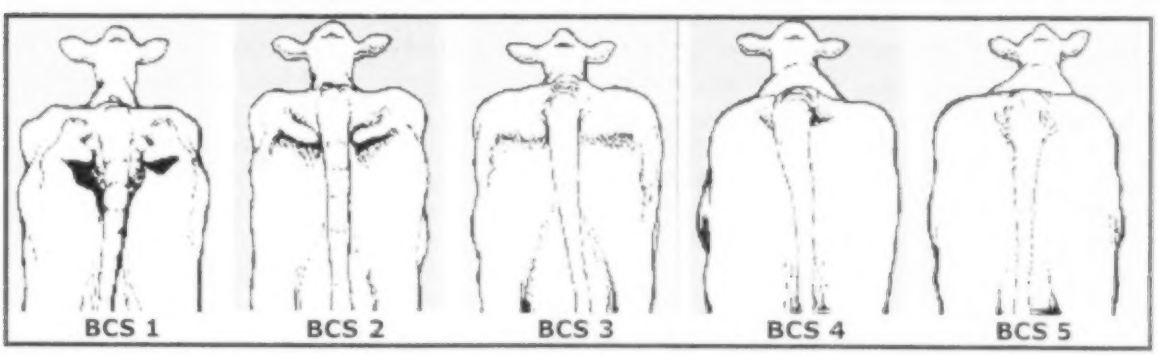

Figure 2: The BCS score estimated by thumb pressure on the short ribs is corroborated by visually appraising fat cover around the tailhead and hips.

For more detailed information see:
Forage beef.ca **www.foragebeef.ca**
Body Condition, Alberta Beef Herd Management Reference Binder p 413.
Beef cow body condition management **www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6775**
Evaluating Cow Nutritional Status NDSU **www.ext.nodak.edu/extpubs/ansci/beef/coping/status.htm**
Body Condition Scoring NDSU **www.ext.nodak.edu/extpubs/ansci/beef/as1026w.htm**

This CattleFACS was made possible through the financial support of the Saskatchewan Beef Development Fund.

Cattle FACS: Managing Water Supplies in a Drought

During extended drought periods, water shortages can become as significant as feed or pasture shortages. The following suggestions may help stretch existing water supplies and minimize negative impacts on animal health and performance.

- Pump water to cattle and fence cattle out of dugouts, ponds, streams and potholes to minimize contamination of scarce supplies from excrement and prevent trampling of side slopes and destruction of the storage reservoir.
  Cattle gain better with clean water. Nose-pumps allow cattle-powered pumping on demand. Solar pumps or windmills can be combined with a holding tank for float-controlled gravity-flow to stock troughs. One large dugout with shallow-buried pipelines to paddocks and fields can provide water more effectively and efficiently than several scattered dugouts. Reduce dugout water loss from evaporation or seepage with covers and/or liners.

- Use continuous aeration of dugout water to maintain oxygen levels, aid decomposition of dead aquatic organisms and reduce growth of algae and other bacteria.
  During a drought there is less runoff to dilute accumulated salts and nutrients. Runoff from a small snow pack may have drift soil in it, adding nutrients to the water. Growth of blue-green algae (Cyanobacteria) some of which produce dangerous toxins is encouraged by a concentration of nutrients in water. Aeration can be done efficiently with a wind powered air pump and an air stone diffusion device.

- Monitor water quality of dugouts and potholes as they dry up and test any new sources of water for mineral content and algae toxins.
  Evaporation concentrates any minerals in the remaining water, which may reduce salt and mineral intake of cattle. If water becomes too salty, cattle will reject it completely. Water with total dissolved solids (TDS) over 3000 mg/l should be further analysed for additional minerals, in particular sulphates. Sulphates over 1000 mg/l can cause scours in calves; interfere with trace mineral availability (e.g. copper) causing depressed growth rates and infertility; or cause thiamine deficiency/nutritional polioencephalomalacia.

- If hauling water is the only alternative, large holding tanks with float-controlled gravity-feed to troughs can reduce the need for daily hauling, yet provide constant water.
  In an emergency, cattle can be watered every second day but this may result in some non-permanent weight loss in mature cows and will reduce calf gains by half a pound per day. Dry cows will graze farther from water than cows with calves, so weaning calves early may allow more effective use of total range forage.

- Trap drifting snow to help replenish water supplies using snowfence.
  Dugout water supply relies on surface runoff from snowmelt, yet snow is usually only 25% of annual precipitation. Wyoming style snow fence (horizontal boards, 50% porosity, 6 feet high) and plastic snow fence (50% porosity, 6 feet high) are most effective at trapping drifting snow and should be placed upwind to the dugout with an 8" gap at the bottom. The fence should be close enough so the bulk of the snowdrift forms in the dugout.

- If the dugout goes dry, use the opportunity to clean it out.

Dredge the muck out of the bottom, deepen it, and remove vegetative growth such as willows or cattails in and around the edges and plant the banks, spoil piles and immediate surroundings to grass. Maintaining good grass cover in the immediate area around the dugout and in riparian areas (runoff runways) will help filter sediment out of runoff water. Plant shelterbelts on the spoil piles to act as snow traps.

For further information:
PFRA – http://www.agr.gc.ca/pfra/drought/article_e.htm
SAFRR - http://www.agr.gov.sk.ca/docs/about_us/programs_services/droughtwatch.asp#1
PAMI – The Stockman's Guide to Range Livestock Watering from Surface Water Sources.
Western Beef Development Centre - http://www.wbdc.sk.ca/factsheets.html

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CattleFACS: Feeding in a Cold Snap

The critical temperature below which an animal must increase heat production to keep warm (i.e. eat more energy, reduce performance or use body reserves), is about -20°C for a mature beef cow on maintenance rations IF:

- She is in good condition (BCS 3.0).
- She has a dry winter haircoat.
- She is sheltered from the wind (and rain or wet snow if it is a regular occurrence).
- She has bedding to lie on.

Anything less than these "ideal" conditions means that the animal will be cold stressed at higher temperatures, -10°C or even 0°C. However, regardless of condition, cattle need extra feed to get through a cold snap with a minimum amount of stress. It is absolutely critical for thin or moderate condition cows (BCS 2.5 or less) as they have little or no back fat to keep them warm.

Have your consulting nutritionist or Extension specialist, with information from a laboratory analysis of your feed or use a program like Alberta's CowBytes, balance rations for whatever is considered "normal" winter temperature, e.g. -20°C. Then be prepared to feed extra energy during cold weather by feeding additional grain or pellets (range or screenings) or even high quality hay.

Remember it takes time for cattle in the early part of winter to adjust to cold. A cold snap in November or December when normal temperature is around -10°C will be felt more severely than a cold snap in January when normal temperature is around -20°C.

Thumb rule

Increase energy at a rate of 1 lb (0.5 kg) grain or pellets for every 5°C drop in temperature at mid-day below -20°C (or -10°C, depending on your "normal" maintenance ration) to a maximum of five pounds (2.5 kg).

For example if the temperature drops overnight from -20°C to -35°C, increase grain by 3 lbs (1.5 kg). If the temperature drops overnight from -10°C to -35°C the cattle need an extra 5 lbs (2.5 kg) of grain to help maintain body temperature.

Be careful of any sudden increase in grain. Make sure that it is spread out so every cow has opportunity to eat, (otherwise some boss cow will get a bellyfull and end up with grain overload). If temperature drops very dramatically, divide the extra grain into morning and night feedings which will get the cows moving around and help avoid over consumption by a few.

If a cold snap is anticipated, begin feeding a little extra grain (1 or 2 lbs; 0.5 or 1 kg) a couple days in advance. Continue feeding reduced amounts of extra grain 2 to 3 days after the temperature returns to "normal". This will avoid sudden large changes in feed and present a more even flow of energy to the animal.

Watch for Rumen Impaction

Digestion of roughages in the rumen creates heat, which summer "goes to waste" but in Canadian winters becomes an important part of animal maintenance i.e. it is used to keep the animal warm.

Cattle will tend to sharply increase feed intake in cold weather in an attempt to maintain body temperature. They may consume more than they can digest of low quality roughage such as straw or chaff, especially if ground or chopped, resulting in rumen or omasal impaction.

DO NOT grind or chop low quality roughages too fine (3/4" or 1" screen max). It costs money and can create impaction problems.

Feeding extra energy during a cold snap will reduce cold stress, maintain animal condition and reduce potential for impaction.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **AAFRD** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI -** http://www.gov.mb.ca/agriculture/livestock/index.html

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Cattle FACS: Feed Testing and Ration Balancing

Use Feed Supplies Efficiently

Cattle use feed most efficiently when the nutrients in the daily feed match their daily requirements, hence the term balanced ration. Producers know they can't eyeball feed value but they sometimes use traditional or book values to estimate feed quality against their cows' feed requirement. These can be useful guides but quality of individual feed supplies can vary widely from the average. Not knowing the exact nutritional value of feeds can lead to underfeeding or overfeeding, both of which cost money.

Nutrient content of feeds vary greatly from year to year because of differences in growing conditions and is also affected by stage of maturity, and method of harvest, storage and processing. Roughage mixtures of unknown proportions or use of unusual feedstuffs or screenings increases the need for precise information. Testing for nitrates, molds, mycotoxins or other anti-nutritive factors prevents problems.

A little time and a few dollars spent planning can mean the difference between satisfactory performance on minimum feed or thin cows, poor calves, low fertility and/or wasted feed resources. Adding the vitamin, mineral and protein supplements and grain necessary to meet but not exceed nutrient requirements lowers production costs by optimizing performance and feed efficiency.

Talk to the feed lab nutritionist, a consulting nutritionist, your feed company nutritionist or your Extension specialist for advice on balancing your rations to meet the needs of your cattle using your feeds to their best advantage.

The most important times to make sure a beef cow's nutritional requirements are met:

- Most important – from calving through breeding.
    - Use the best quality feeds during this period.
- Next most important – 3rd trimester of pregnancy or about 60 to 90 days before calving.
    - Use moderate quality feeds during this period
- Third most important – breeding through to weaning.
- Least important (IF the cow is in moderate to good condition) – weaning to end 2nd trimester.
    - Use poorer quality feeds during this period.

Feed Sampling Procedures

Accuracy of analysis is no better than accuracy of sampling procedure. The following recommendations are designed to ensure the sample is representative of the entire lot. Labs and local Extension offices may supply request forms, sample bags and forage probes.

Grains: Take 15-20 samples from tailgate at unloading or 15 to 20 bin probes. Mix thoroughly and take 500-gram or 1 litre sample for analysis; double for Ergot testing.

Ground-mixed rations: Take 3 to 5 samples at feeding over three feedings. Mix thoroughly and take a 500-gram or 1 litre sample for analysis, double for multiple or particle size analyses.

Supplements: Take 15-20 samples from tailgate at unloading or 15 to 20 bin probes. Mix thoroughly and take 500-gram or 1 litre sample for analysis.

Hays: Use a hay core sampler (forage probe) to take 15 to 20 samples from throughout the stack or lot of hay. Mix thoroughly and take a 2-litre volume sample for analysis.

Silages and Total Mixed Rations (TMR): Take 5 or 6 samples from 3 or 4 feedings. Keep refrigerated in an airtight bag with air squeezed out between collections. Mix thoroughly and take a 2-litre sample for analysis. Keep cool and in an airtight container with air squeezed out. Freeze before shipping.

Water: Contact the laboratory for special water sample containers to reduce contamination and for special instructions if bacterial analysis is desired.

Sample Shipping Procedures

- Good quality large Ziploc plastic bags work very well for sending dry or moist samples.
- Include sender's name address and contact information, sample identification, tests requested on a label on each sample bag.
- Bus or courier is most cost effective method of shipping as samples are usually received at the lab the next business day.

Feedtest Laboratories

A full range of feed testing packages is available from several laboratories. Example analyses include crude protein, fibre (estimation of energy and intake), minerals and possible toxic substances.

ENVIRO-TEST LABORATORIES
www.envirotest.com
124 Veterinary Road, Saskatoon, SK S7N 5E3
Tel: 306-668-8370; Fax: 306-668-8383
Toll free: 800-668-7645

CENTRAL TESTING LABORATORY LTD.
www.ctl.mb.ca
Unit 9 - 851 Lagimodiere Blvd., Winnipeg, MB R2J 3K4
Tel: 204-237-99128; Fax: 204-233-0489
Toll Free: 877-955-7861
Email: info@ctl.mb.ca

NORWEST LABS
www.norwestlabs.com
3131-1 Avenue South, Lethbridge, Alberta T1J 4H1
Phone: (403) 329-9266 Fax: (403) 327-8527
Toll Free in western Canada: 800-773-3962
Email: Lethbridge@norwestlabs.com

MIDWEST LABORATORIES CANADA
http://www.midwestlabscanada.com
#8, 4001B-19th Street N.E., Calgary, AB T2E 6X8
Tel: (403) 250-3317; Fax: (403) 250-5249
Email: mwl@midwestlabscanada.com

BDS LABS (FOR MOLDS AND MYCOTOXINS ONLY)
http://www.bdslabs.com
#13 Qu'Appelle St., PO Box 363, Qu'Appelle, SK S0G 4A0
Tel: 306-699-2679; Fax: 306-699-7190
Toll Free: 888-237-5227
Email: bds.laboratories@sasktel.net

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Cattle FACS: Early Weaning of Calves

One of the options when drought severely reduces pasture quantity or quality is weaning the calves earlier than normal. There is little point in leaving a calf on its mother when her milk production has dropped off because of lack of feed. Calf gains are very poor yet as long as the cow is trying to produce milk, the nursing calf will drag her down nutritionally. The result is a light calf and a thin cow going into winter, which will need extra feed to reduce cold stress and restore body fat reserves. Thin cows suffer cold more than cows in good condition.

Benefits of Early Weaning

Feeding that thin cow over winter can easily cost an extra $100 or more compared to feeding a cow going into winter with a Body Condition Score (BCS) of 3.0. If the cows can gain body condition before winter, weaning early this year may save feed this winter, save next year's breeding season and weaning weights and save both percentage calf crop and weaning weights two years following. Early weaning of first calf heifers, especially good milkers, to allow them to gain condition before winter is especially critical to their fertility the following year.

Weaning the calves at 100 days of age reduces daily Digestible Energy (DE) and Crude Protein (CP) requirements of high producing nursing cow by over 40%. Weaning at 150 days reduces DE and CP requirements of the same cow by about 33%. This lets the cow to adapt to reduced feed availability, stretches existing pasture and except in extreme feed shortage allows the cow to maintain or improve body condition before winter.

If you are already buying feed for the cows on pasture, then weaning as soon as possible is even more important. Feeding the weaned calf and cow separately rather than feeding to cow to produce milk to feed the calf saves 15 to 20% in feed quantity and quality.

Where forage quality is very poor in late summer and early fall, early weaning should be a routine management practice.

Managing the Early Weaned Calf

As any dairy operator knows, calves can be weaned at very young ages BUT the younger the calf the higher the feed quality and management requirements. If the health, nutrition and physical needs of calves are met, subsequent performance will be every bit as good as if the calf had stayed with its mother on good pasture.

Follow regular weaning management routines, which should include the following:

- Castration, dehorning, branding etc should be done well before weaning.
- Vaccination and parasite treatment programs recommended by your veterinarian should be carried out at least three weeks before weaning.
- Start calves on the weaning ration as creep feed three weeks prior to weaning.
- Wean onto long grass hay, gradually introduce chopped alfalfa over two weeks. Silage is not recommended as taste and bulk discourages intake.
- Keep clean water and a complete vitamin-mineral mix (loose, not block) available free choice.
- Keep careful watch for sick calves. Early recognition and treatment is critical.

Health problems with early-weaned calves are less if the calves are kept on the home ranch. In drought conditions, respiratory disease caused by dust is a real problem with weaned calves. A small well sheltered pen or pasture will reduce fence travel. Limiting the number of calves in a pen to 20 to 25 for the first two weeks allows young timid calves opportunity to eat and drink.

Feeding the Early Weaned Calf

Early weaned calves need high quality, easy digested growing rations, which they can consume at 2.5 to 3.0 % of body weight in dry feed per day. The ration should produce gains comparable to those on the cow and not fatten them too early.

A 300 lb calf will gain about 2.0 lbs per day, eating about 8 or 9 lbs of a 50:50 hay: concentrate ration with about 15% Crude Protein (CP) and 70% Total Digestible Nutrients (TDN) (1.4 Mcal Digestible Energy (DE)/lb). Larger framed fast growing calves, which normally gain 2.5 lbs per day or better, will need a correspondingly higher energy-higher protein ration. (The cost per tonne of calf feed may seem high but cost of gain is cheaper than buying feed for the cow to feed the calf or having a thin cow going into winter).

Requirements of calves for high quality ration, about 75% TDN (1.5 Mcal DE/lb):

- Wean at 100 days or earlier – 18% CP dairy calf ration plus high quality chopped alfalfa hay
- Wean at 150 days – 14% CP growing ration plus high quality alfalfa-grass hay.

Calves are more easily weaned at 150 days as rumen function develops around 120 days of age.

Note: Do NOT use feeds with Urea on early-weaned calves, as they do not metabolize it very well; better to use supplements with natural protein sources such as soybean meal or canola meal.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **AAFRD** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI -** http://www.gov.mb.ca/agriculture/livestock/index.html

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Cattle FACS: Creep Feeding Calves

Creep feeding is one of the management strategies which can be employed when drought reduces pasture quantity or quality. It can increase calf weights by up to 50 lbs and cow weights by up to the same amount.

Every pound of creep feed eaten can save up to a pound of forage dry matter, which the calf would otherwise consume. This takes some pressure off the cow, helping to maintain or improve her body condition. Bringing the cow into winter in good body condition has the advantage of reducing cold stress and related feed requirements and maintaining next year's fertility.

Creep feeding fits well with an early weaning strategy – creep feed can be used from when calves are about 50 days of age until they are about 400 lbs or 150 days of age and then wean. Weaning stress is greatly reduced, as calves are accustomed to dry feed.

Rations for Creep Feeding

Calves like whole or coarsely rolled or ground grain. Good quality whole oats is a favourite creep feed. The bulk of whole oats reduces over consumption problems and calves seem to like to chew the grain better than cows.

A complete creep ration should contain 1.4 Mcal DE/lb or 70% TDN and 13% to 16% crude protein, 0.7% Ca, 0.5% P, TM salt and vitamins ADE (plus Se in deficient areas).

When pastures are dry, protein content of the grass is much lower. Added protein in the creep makes sense under those conditions. Use a natural protein source, pelleted so it won't separate from the whole or coarse grain and bring the creep ration to 16%.

An example ration might be 40% rolled barley, 50% whole oats and 10% pelleted canola meal or soybean meal plus free choice complete mineral mix with vitamins. A complete pelleted creep might be 25% oats, 50% barley, 25% canola plus salt, vitamins and minerals.

Coarse rolled field peas added to the grain mix at e.g. 25%, increases both energy and protein. However calves find it quite palatable and may over eat so hand feeding to limit consumption may be necessary.

Pea or lentil screenings added to the grain mix may be a less expensive alternative to increasing protein levels and still provide bulk in the ration. Screenings from e.g. canola may be less palatable. Bran in the mix increases palatability and its bulk helps reduce overeating.

Creep Feeding Management

Fencing off a small shaded area near the water source works well, however a moveable creep feeder may allow better pasture management. Creep feeding works better on smaller pastures compared to open range.

Creep feed can be fed in bunks, troughs or self-feeders. An opening 16 to 18 inches (40 to 45 cm) wide and 3 to 3.5 feet (0.9 to 1 meter) high will keep the cows out and let the calves in. Provide 12 inches (30 cm) of bunk space for every three calves.

A few management tips will help the process:

- Young calves are very susceptible to digestive upsets (acidosis and scours) from inconsistent feed intake.
- Hand feed the creep feed at first to avoid over eating.
- Put out only enough feed for a week as calves find stale feed unpalatable.
- Monitor intake on a daily basis even when on self-feed.

- Do not let the creep feeder go empty for more than a few hours to avoid overeating.
- Intake thumb rule is 1% of body weight e.g. 1 lb (1/2 kg) creep feed for every 100 lbs (50 kg).
- Avoid dusty fine ground feed. Addition of 5% molasses or 2% canola oil will reduce dustiness, reduce sorting of pellets or minerals from the grain and increase palatability.
- Ensure heifer calves to be kept for breeding do not get too fat. Fat in the developing udder can greatly reduce her lifetime milking ability as a cow. Some research has shown that creep feeding replacement heifers for longer than 3 to 6 weeks can reduce lifetime milk production by up to 25%.

As a regular management practice, *OTHER THAN when typically used in late fall when cows' milk production drops off along with forage quality and quantity*, creep feeding has a number of disadvantages. These must be taken into account when calculating the economic value and include such issues as cost relative to added gain, masking effect on dam's milking ability, value of added weaning weight at sale, subsequent performance of the calf in a feedlot or as a replacement.

However, as an emergency measure in times of serious drought with limited pasture resources, especially in combination with early weaning, creep feeding can be a useful management practice which helps maintain weaning weights and cow body condition.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **AAFRD** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI -** http://www.gov.mb.ca/agriculture/livestock/index.html

This CattleFACS was made possible through the financial support of the Saskatchewan Beef Development Fund.

Cattle FACS: Dealing with Problem Feeds

Knowledge of how to deal with problem feeds may allow use of some low cost alternatives when drought reduces pasture and winter feed supplies and producers are faced with buying feed. Having a nutrient content analysis of any feedstuff and seeking advice from a nutritionist and veterinarian will also help prevent and/or alleviate problems, which may occur.

Mouldy feeds have reduced nutritional value as mould growth leads to loss of dry matter, digestible energy and vitamin E. Mouldy feeds may be dusty from fungal spores. Inhaling or ingesting spores may cause fungal pneumonia, uterine infections, and mycotic abortion. Mycotoxins from moulds may cause vaginal bleeding, rectal or uterine prolapse, and abortion though cattle are somewhat less susceptible than pigs.

- Screen samples at a Feedtest Lab for presence and types of moulds and toxins.
- Do not feed to pregnant or lactating cows or young animals.
- Dilute with good quality feeds, introduce slowly.
- Balance the ration. Slight nutritional deficiencies can increase susceptibility to mycotoxins.
- Feed adequate levels of Vitamin ADE.

Mouldy sweet clover silage or hay (not other clovers) can produce dicoumeral, which results in bleeding disorders in cattle (blood won't clot properly).

- Feed 7 to 10 days, then feed another hay for 7 to 10 days to allow dicoumerol to clear the system and stop feeding entirely 2 to 4 weeks prior to calving and during calving.

Ergot contaminated grain can cause impairment of blood circulation to the extremities resulting in a dry gangrene in cattle with loss of tail, ears and perhaps hooves.

- Ergot contaminated grain should be diluted with clean grain until the ergot bodies are fewer than 10 per litre of grain (0.1%).
- NEVER feed ergot contaminated grain to pregnant or lactating animals.

Canola hay and silage, if cut in mid bloom, make excellent feed (similar to good alfalfa-grass hay, however at later stages nutritional quality is more like slough hay):

- Canola contains high sulphur levels in the range of 0.5 to 1.3%. Over 0.4% sulphur in total dry matter intake can reduce Cu absorption and cause copper deficiency.
- High sulphur in the diet can also cause impairment of thiamine (*Vitamin B1*) production and result in *Thiamine Deficiency Polioencephalomalacia,* especially in younger animals.
- Include sulphur and nitrates in feed analysis.
- Feed TM salt with 2500 mg/kg or higher of copper and 90 to 120 mg/ kg selenium, or 1:1 minerals with CU 2500 mg/kg or higher and 25 to 60 mg/kg selenium.
- Limit to 50% to 60% of total dry matter intake.

Slough hay is variable in quality. It may have adequate quality to winter a beef cow, or may be not much better than straw, (low in energy and protein)

- Watch for poisonous plants unless you are familiar with the source. Roll out bales and let cows eat selectively.

Russian thistle, if cut green is quite palatable and equal to fair quality hay in CP but lower in TDN and is VERY laxative because of high ash content.

- Contains small levels of oxalates which are likely not harmful to livestock and may also contain high levels of nitrates.
- Include testing for oxalates and nitrates in feed analysis.

Wild Barley or Foxtail has very rough awns, which can become impacted in the mouths of cattle and cause abscesses in the jaws and throats. Grinding with a hammermill may help.

- AVOID feeds with any quantity of "Foxtail".

Kochia weed, if harvested before maturity, has protein and energy contents as high as good alfalfa hay but it has a high mineral content and is extremely laxative.

- Kochia has a high oxalate level which binds calcium in the bloodstream.
- Unconditioned hungry animals allowed to graze green kochia may develop hypocalcaemia or "Milk Fever" if serum Ca levels drop more than 20%. Symptoms include laboured breathing, depression, weakness, convulsions, tetany and possibly death.
- Kochia should not make up more than 30% of the total diet. Feed 3:1 mineral or add limestone to a mixed ration to ensure enough Ca in the diet.
- Beware also of overgrazed pastures in the spring, where young kochia plants may be available in abundance. Toxins present in early spring kochia growth may cause severe photosensitivity (sunburn), if eaten in large enough amounts.

Cereal straw, stockpiled forages and other low-quality roughages are not "problem" or "alternate" feeds, however there are a few issues, which should not be overlooked.

- Straws differ dramatically in nutritional content and digestibility. Oat straw is better than barley straw, which is better than wheat straw.
- **Flax straw** is very palatable but should be tested for high levels of prussic acid if green or frozen.
- Digestibility and rate of passage limits useful dry matter intake of straw to about 1.25% of body weight. Grinding or chopping straw will increase intake but consumption in excess of what the cow can digest can lead to rumen impaction. Intake of year-old straw is somewhat higher because fungal activity on the cell walls improves rate of rumen passage.
- **Pulse straws** are better than cereal straws but dry matter intake is still limited to about 1.6% of body weight.
- Feeding protein supplements to cows fed low quality roughage, including stockpiled forages, can increase intake by as much as 30% and digestibility by as much as 10 percentage units. Feeding protein balances the diet for the rumen microbes, enabling cattle to eat more roughage and get more energy from each pound eaten.
- The key to wintering cows on straw based diets is properly balanced rations. Feed with adequate energy, protein, vitamins and minerals and increase grain feeding in cold weather to prevent over consumption of straw and possible rumen impaction.

Cereal greenfeeds and silages are not considered either problem or alternate feeds. However, they can accumulate nitrates when drought or frost stressed and have high potassium and low calcium contents that can cause milk fever (hypocalcaemia) in lactating cows.

- Include nitrates, and potassium in feed analysis.
- Feed 2:1 or 3:1 mineral plus extra limestone if necessary.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **AAFRD** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI -** http://www.gov.mb.ca/agriculture/livestock/index.html

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Cattle FACS: Annual Crops for Emergency Grazing

Use of cereals for emergency grazing or greenfeed can reduce damage to perennial pastures from over grazing, limit the need for costly purchased feed and help to get the cow herd into winter in good body condition. Cereal crops can be seeded in anticipation of need or salvaged for pasture or winter feed when it becomes obvious they are not going to make a crop or the need for feed outweighs the value of the grain.

Spring Cereals

Oats or barley seeded into stubble at 2-3 bu. per acre can provide emergency pasture as soon as 6 weeks after seeding when the plants are about 6" high.

- Oats provides the highest dry matter yields per acre. Oats is not a drought tolerant as barley but can be seeded deeper into moisture.
- Spring cereals must be continuously grazed to keep from heading out. Cross fence and rotational graze with a stocking density of at least two animals per acre.
- Graze off about 50% of the plant material (from 6" down to 3") or from when the seed rows are covered until they are visible again, then move to another pasture and return when growth is back to 6" again (about 3 or 4 weeks).
- If a field gets ahead of you, swath it in the milk (oats) to soft dough (barley) stage for green feed.

Drought damaged spring cereals can be salvaged for greenfeed or pasture (check with Crop Insurance first).

- Cereal crops can accumulate nitrates, resulting in nitrate poisoning if fertilized with high levels of nitrogen (N) and/or stressed by drought, hail or frost.
- Cut in best condition possible and check for nitrates before feeding. Stack bales from fields separately so low nitrate feeds can dilute higher.
- Check for nitrates before grazing.
- Giving the microbes time to adjust whether to greenfeed or grazing reduces the risk of nitrate poisoning.

Winter Cereals

Winter cereals planted in combination with oats or barley in the spring will provide grazing in about six weeks and right through until late fall. Animals will graze the spring cereals until the winter cereals take over. Spring planted winter cereals remain vegetative all that year reducing management requirements.

- An example rate might be 25 lbs oats with 80 lbs winter wheat or triticale per acre. (27.5 kg and 88 kg per ha.)
- If silage or greenfeed is to be cut from the spring cereal, leaving the winter cereal to provide late summer and fall grazing then seed together at ¾ normal seeding rate of each crop, depending on moisture conditions.
- Begin grazing when the crop is about 6 inches tall and follow the same rotational grazing patterns as with spring cereals.
- **Winter Triticale** worked best in research at Melfort and Lacombe. It grew well and winter-killed so reseeding in spring was no problem.
- **Winter Wheat** seed is readily available, it grows well but can be susceptible to rust. It usually winter kills so reseeding in spring shouldn't be a problem.
- **Fall Rye** is the hardiest, usually over winters and works well for early spring pasture. However, reseeding the field to another crop will require Roundup or an extra tillage operation in spring.
- Harvest fall rye as silage or hay prior to the early milk stage as quality drops rapidly with decreasing digestibility and lowered palatability and intake. Palatability of fall rye is not a problem when it is grazed.

The problem with using an over wintered crop for spring grazing is that by the time it has any growth and the cattle then eat it off, it is mid-June – too late to reseed.

- Over wintered crops can be kept in a vegetative condition by using rotational grazing with short rotations and adequate livestock to keep the seed heads grazed off and the plants in a leafy state.

Management Notes

- Check recommendations for varieties and seeding rates in your area.
- Check drought stressed cereals for nitrates before grazing.
- Vegetative cereals are high in protein and low in fibre, which may cause diarrhea when first grazed. Animals will always be "loose".
- **Ensure a complete 2:1 or 3:1 mineral mix is available at all times** in loose form to encourage intake. Cereals may be high in Potassium (K) and low in Magnesium and Calcium (Mg, Ca). Grass tetany (grass staggers) or hypocalcaemia (milk fever) may be problems under extreme conditions.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **PFRA Drought Watch** – http://www.agr.gc.ca/pfra/drought
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **AAFRD** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI -** http://www.gov.mb.ca/agriculture/livestock/index.html

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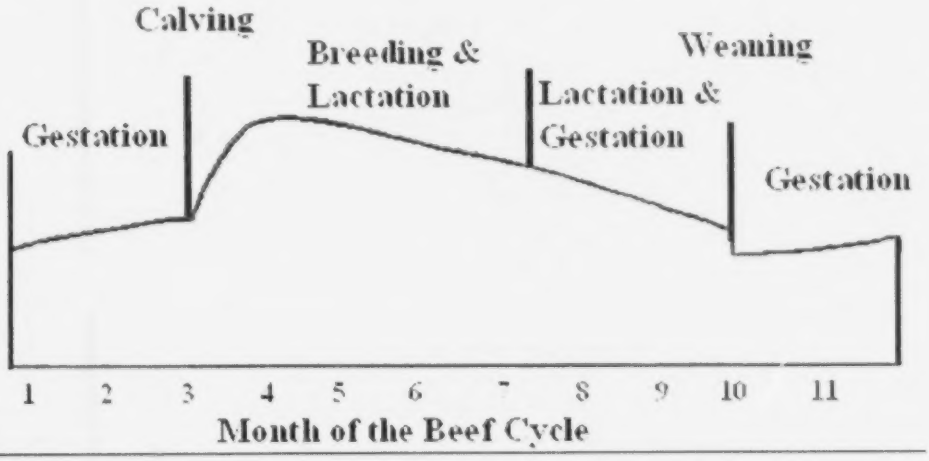
CattleFACS: Not Enough Feed for the Winter?

Getting through the winter when feed is scarce and expensive means getting the most out of every forkful. It is really an on-going management strategy in well-run and profitable herds where production costs are constantly pared to the bone. Planning ahead from the first sign of drought for available winter feed (quality and quantity) can get the bulk of the herd through winter without spending too much money or without sacrificing productivity the following year.

Match Feed Nutrients To Animal Needs

- Save best feed quality for after calving, next best for 60 days before calving.
- Group cattle by feed requirements to reduce over and under feeding: 1) mature cows in moderate to good condition, 2) thin and older cows, 3) replacement heifer calves, 4) bred yearling and rebred two-year-old heifers (or group 2,3 and 4 together).
- "Test, don't guess" - Feed test and balance rations based on actual nutrients in the feed.
- Feed or inject vitamins; feed minerals free choice with salt or mixed in grain; use protein supplements with low quality roughages, especially with thin or young, growing cattle.
- Boost feed in cold weather, especially to young or thin cattle.



Total Nutrients Needed for Production and Maintenance

Dr. J.M. Bell, U of S

Minimize the Herd's Feed Requirements

- **Use herd records** to keep only the best breeding cows or replacement heifers.
- **Pregnancy test**. Cull open cows, bad feet, legs, udders, eyes, temperament, hard calvers and poor mothers.
- **Use Body Condition Scores** (BCS) to manage the herd. Year round feeding management should target a goal of moderate to good condition (BCS ≥2.5) at calving because cows will cycle and breed sooner than thin cows (BCS ≤2.0).
  - ✓ Cows going into winter with BCS ≥3.0 can afford to lose ½ BCS or about 100 lbs.
  - ✓ Thin cows need up to 30% more feed over winter than cows in moderate condition in order to gain enough weight to achieve BCS 2.5 at calving and up to 70% more feed than a cow carrying some backfat (BCS≥3.0).
- **Manage feed to reduce waste** – feed on clean snow, use "tombstone" bale feeders, feed under a hot wire, use moveable bottomless bunks from drill stem or other pipe, use

old mine conveyor belting to make portable feed troughs, grind and mix with more palatable roughages – whatever works!

- **Treat cattle for external parasites** (warbles and lice). Internal parasites may also be worth treating, on advice of a veterinarian.

Maximize Value of Feed Supply

- **Ammoniation of straw and chaff** improves dry matter and energy digestibility, crude protein content and rate of passage. Ammoniation can increase an animal's voluntary intake of digestible energy from straw or chaff by as much as 50%. Ammoniated straw and chaff should still be feed tested and will still need supplementing with minerals, vitamins and possibly some grain, especially for thin cattle or young cattle.
- **Supplement low quality roughages** such as mature range grass, slough hay, stubble and straw or chaff piles or rows in the field, etc. They are too low in protein (and energy, minerals and vitamins) to support sufficient microbial growth in the rumen for optimal digestion. Supplementation with natural protein or NPN + grain will allow animals to get much more feed value out of the same feed – range pellets, lick tanks, molasses tubs or a home-mixed grain-protein-vitamin-mineral supplement
- **Grinding coarse or poor quality feeds** will increase feed value by increasing intake and reducing wastage. Mixing with moderate quality roughages will increase palatability and/or dilute anti-nutritive factors such as nitrates. Feed test the mixtures so exact nutritional information is available. Don't grind too fine (3/4 or 1 in. screen max.) and don't grind at all if cattle can get enough to eat without.

For more information:

- **Western Forage Beef Group (Foragebeef.ca) –** www.foragebeef.ca
- **Western Beef Development Centre -** http://www.wbdc.sk.ca
- **PFRA Drought Watch** – http://www.agr.gc.ca/pfra/drought
- **Prairie Feed Resource Centre** http://feedresources.usask.ca
- **SAFRR -** http://www.agr.gov.sk.ca/Livestock.asp?firstPick=Livestock
- **SAFRR Drought Watch -** http://www.agr.gov.sk.ca/docs/about_us/programs_services/droughtwatch.asp
- **AAFRD Ropin' the Web** - http://www1.agric.gov.ab.ca/app21/rtw/index.jsp
- **MAFRI Livestock** - http://www.gov.mb.ca/agriculture/livestock/index.html

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Cattle FACS: Nitrate Poisoning

All plants contain some nitrate, but excessively high amounts are likely to occur in forages grown under stress conditions such as drought, frost, hail, low temperatures, herbicide applications or diseases.

Why Plants Accumulate Nitrates During Drought Conditions

When growing conditions are favourable, plants take up nitrogen largely in the form of nitrate. The nitrate is rapidly converted to ammonia which is incorporated into plant protein. Unfavourable growing conditions can interfere with nitrate use and cause it to accumulate in the plant. Under normal conditions, cattle convert the nitrates in forage to nitrite. This is then converted to ammonia and used by rumen microbes to make protein.

The problem arises when nitrate converts to nitrite faster than nitrite converts to ammonia.When this occurs, nitrite accumulates and is absorbed into the bloodstream where it binds to hemoglobin thus reducing the oxygen carrying capacity of the blood. Animals can die by suffocation.

The amount of nitrate in plant tissues also will depend on plant species, stage of maturity, part of the plant and nitrogen fertilization. If the stress is removed and the plants recover, excess nitrate stored in the plant is metabolized over several days. Feed test to be sure

Legumes do not store excess nitrates in the plant material. Alfalfas, vetches, trefoils, peas and clovers generally do not accumulate nitrates.

Stage of growth markedly changes the nitrate content of forages. Nitrate concentrations usually are higher in young plants and decrease as the plant matures. However, plants grown in soils with excessive nitrates or grown under stress may be high in nitrate content at maturity.

Plant parts closest to the ground contain the most nitrate. Leaves contain less nitrate than stalks, and the seed (grain) and flower usually contain little or no nitrate. Most of the plant nitrate is in the bottom third of the stalk.

Nitrates in the soil are the source of nitrate in plants. While a positive relationship exists between soil nitrates and nitrate in the plant, the effect of nitrogen fertilization appears to be less important than the conditions listed previously in causing high nitrate content in forages.

Managing High Nitrate Feeds

- Forages that contain high nitrate levels can be diluted in the diet with grains or with other forages low in nitrates and then can be fed safely.
- Feeding grain in combination with high nitrate feeds helps reduce the effect of the nitrate content. Energy from the grain helps complete the conversion of nitrate to bacterial protein in the rumen.
- Frequent intake of small amounts of a high nitrate feed increases the total amount of nitrate that can be consumed daily by livestock without adverse effects, and helps livestock adjust to high nitrate feeds. Feed long stem forages such as oat or barley hay that contain high amounts of nitrate in limited amounts several times daily rather than feeding large amounts once or twice daily.
- Under the right conditions pastures can also accumulate nitrates. Implementing good pasture management practices will reduce the risk of livestock losses to nitrate toxicity. Providing other feeds that contain little or no nitrate and grazing suspected pastures for limited periods of time each day for the first week to acclimate cattle will also help to

reduce the risk. If possible, do not graze suspected pasture until one week after a killing frost.

Treating Nitrate Poisoning

- When nitrate is suspected, remove the contaminated feed and provide a high energy feed such as barley.
- A veterinarian should be called immediately to confirm the tentative diagnosis.
- Handle cattle as little and as quietly as possible to minimize their oxygen needs.
- Administer a four percent (4%) methylene blue solution intravenously at a dosage rate of 4.55 mg per lb of body weight.
- Treatment may have to be repeated every six to eight hours.
- Mineral oil may be given orally to protect the irritated mucous membranes.

For more detailed information see:

Nitrate Toxicity SAFRR
http://www.agr.gov.sk.ca/Livestock/Beef.asp?firstpick=Livestock&secondpick=Beef

Nitrates
http://www.foragebeef.ca/$foragebeef/frgebeef.nsf/all/ccf57?opendocument&site=fbca

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